

Pending Claims with Amendment in Voluntary Format

Please cancel claim 2; amend claims 1, 3, 6-8, 10, and 17; and add claims 28-31
as follows:

1 1. (Amended) A method of monitoring input light having a plurality of spectral
2 bands, the method comprising:
3 during a first time interval,
4 separating a first spectral band of the plurality of spectral bands from the
5 plurality of spectral bands,
6 directing the first spectral band to a photodetector while preventing the
7 spectral bands in the plurality of spectral bands other than the first spectral band from
8 reaching the photodetector,
9 generating a first power signal representing combined optical power of the
10 spectral bands other than the first spectral band, and
11 generating, with a wavelength-monitoring circuit that is coupled to the
12 photodetector, a first signal representing a quality characteristic of a modulated or
13 unmodulated pattern of light in the first spectral band; and
14 thereafter, during a second time interval,
15 separating a second spectral band of the plurality of spectral bands from
16 the plurality of spectral bands,
17 directing the second spectral band to the photodetector while preventing
18 spectral bands in the plurality of spectral bands other than the second spectral band from
19 reaching the photodetector, and
20 generating, with the wavelength-monitoring circuit, a second signal
21 representing a the quality characteristic of a the modulated or unmodulated pattern of
22 light in the second spectral band.

1 2. (Canceled).

1 3. (Amended) ~~The method of claim 1, and further~~ A method of monitoring input
2 light having a plurality of spectral bands, the method comprising:

3 during ~~subsequent~~ successive time intervals,
4 separating each spectral band of the plurality of spectral bands from the
5 plurality of spectral bands,
6 directing the separated spectral band to the photodetector while preventing
7 the spectral bands other than the separated spectral band from reaching the photodetector,
8 and
9 generating, with the wavelength-monitoring circuit, a signal representing a
10 quality characteristic of a modulated or unmodulated pattern of light in the separated
11 spectral band, the quality characteristic being one or more of signal-to-noise ratio, bit
12 error rate, specific bytes in SONET frames, and optical wavelength center frequency.

1 4. The method of claim 1, wherein the first and second signals represent, for the
2 first and second spectral bands, one or more of signal-to-noise ratio, bit error rate, optical power
3 level, and optical wavelength center frequency.

1 5. The method of claim 1, wherein:
2 the modulation pattern implements SONET STS-1 frames; and
3 the first and second signals represent specific bytes in the SONET frames.

1 6. (Amended) Apparatus for monitoring input light having a plurality of spectral
2 bands, the apparatus comprising:
3 an optical train that intercepts the input light and provides optical paths for
4 routing the spectral bands;
5 a photodetector;
6 a routing mechanism that operates to direct selected spectral bands to said
7 photodetector;
8 an electrical circuit coupled to said photodetector to provide a signal representing
9 a quality characteristic of a modulated or unmodulated pattern of light impinging on said
10 photodetector, the quality characteristic being one or more of signal-to-noise ratio, bit error rate,
11 specific bytes in SONET frames, and optical wavelength center frequency; and
12 a control circuit coupled to said routing mechanism to cause only a first selected
13 spectral band to be directed to said photodetector during a first time interval and to cause only a

14 second selected spectral band to be directed to said photodetector during a second time interval,
15 whereby said electrical circuit provides, during said first and second intervals, respective first
16 and second signals representing the quality characteristic for the first and second selected
17 spectral bands.

1 7. (Amended) The apparatus of claim 6, and further comprising:
2 an additional photodetector; and
3 ~~wherein said~~ an additional electrical circuit that provides a signal representing
4 optical power of those spectral bands other than the , for each selected spectral band, one or more
5 of signal-to-noise ratio, bit error rate, optical power level, and optical wavelength center
6 frequency.

1 8. (Amended) ~~The apparatus of claim 6, wherein:~~ Apparatus for monitoring
2 input light having a plurality of spectral bands, the apparatus comprising:
3 an optical train that intercepts input light and provides optical paths for routing
4 the spectral bands, wherein said input light is subject to a modulation pattern that implements
5 SONET STS-1 frames; and
6 a photodetector;
7 a routing mechanism that operates to direct selected spectral bands to said
8 photodetector;
9 said an electrical circuit, coupled to said photodetector, that provides a signal
10 representing specific bytes in the SONET frames of said modulated pattern of light impinging on
11 said photodetector; and
12 a control circuit coupled to said routing mechanism to cause only a first selected
13 spectral band to be directed to said photodetector during a first time interval and to cause only a
14 second selected spectral band to be directed to said photodetector during a second time interval,
15 whereby said electrical circuit provides, during said first and second intervals, respective first
16 and second signals representing -specific bytes in the SONET frames for the first and second
17 selected spectral bands.

1 9. The apparatus of claim 6, wherein

2 said control circuit sequentially causes said routing mechanism to select each of
3 the plurality of spectral bands so that the plurality of spectral bands are sequentially
4 communicated to said photodetector in a round-robin fashion.

1 10. (Amended) ~~The apparatus of claim 6, wherein:~~ Apparatus for monitoring
2

3 an optical train that intercepts the input light and provides optical paths for
4 routing the spectral bands;

5 a photodetector;

6 ~~said~~ a routing mechanism that includes a plurality of dynamically configurable
7 routing elements corresponding to the plurality of spectral bands, each routing element having
8 first and second states, said first state causing that routing element to direct its respective spectral
9 band to said photodetector, said second state causing that routing element to direct its respective
10 spectral band so as not to reach said photodetector; and

11 an electrical circuit coupled to said photodetector to provide a signal representing
12 a quality characteristic of a modulated or unmodulated pattern of light impinging on said
13 photodetector; and

14 a control circuit coupled to said routing mechanism to cause only a first selected
15 spectral band to be directed to said photodetector during a first time interval and to cause only a
16 second selected spectral band to be directed to said photodetector during a second time interval,
17 whereby said electrical circuit provides, during said first and second intervals, respective first
18 and second signals representing the quality characteristic for the first and second selected
19 spectral bands, wherein

20 said control circuit sequentially selects each routing element in a desired subset of
21 the plurality of routing elements so that the corresponding subset of spectral bands are
22 sequentially communicated to said photodetector in a round-robin fashion, whereupon the
23 spectral bands in said subset of spectral bands are monitored for quality by said electrical circuit
24 and spectral bands not in said subset are not monitored for quality by said electrical circuit.

1 11. The apparatus of claim 10, wherein:

2 said second state of each of said routing elements causes that routing element to
3 direct its respective spectral band to a common location.

1 12. The apparatus of claim 11, and further comprising an additional
2 photodetector that generates a signal representing optical power of light impinging on said
3 common location.

1 13. The apparatus of claim 6, wherein said optical train includes a dispersive
2 element.

1 14. The apparatus of claim 10, wherein at least one of said dynamically
2 configurable elements is a rooftop prism whose position can be changed to define said first and
3 second states.

1 15. The apparatus of claim 10, wherein at least one of said dynamically
2 configurable elements includes a mirror whose orientation can be changed to define said first and
3 second states.

1 16. The apparatus of claim 12, further comprising an additional electrical circuit
2 that is connected to said additional photodetector and computes the total optical power incident
3 on said additional photodetector and sets a threshold for triggering a fault condition if said
4 optical power falls below said threshold.

1 17. (Amended) ~~The apparatus of claim 6, incorporated into a system that further~~
2 ~~includes:~~ A system for monitoring light having a plurality of spectral bands and traveling along
3 an optical fiber, the system comprising:
4 a wavelength monitor;
5 a coupler that directs a fraction of light traveling on a said fiber to be monitored to
6 said ~~optical train~~ wavelength monitor;
7 said wavelength monitor including:
8 an optical train that intercepts light directed to said wavelength monitor by
9 said coupler and provides optical paths for routing the spectral bands;
10 a photodetector;

11 a routing mechanism that operates to direct selected spectral bands to said
12 photodetector;
13 an electrical circuit coupled to said photodetector to provide a signal
14 representing a quality characteristic of a modulated or unmodulated pattern of light
15 impinging on said photodetector; and
16 a control circuit coupled to said routing mechanism to cause only a first
17 selected spectral band to be directed to said photodetector during a first time interval and
18 to cause only a second selected spectral band to be directed to said photodetector during a
19 second time interval, whereby said electrical circuit provides, during said first and second
20 intervals, respective first and second signals representing the quality characteristic for the
21 first and second selected spectral bands; and
22 a management processor that receives information based on said signal
23 representing a quality characteristic.

1 18. (Previously amended, now allowed) Apparatus for monitoring at least one
2 characteristic of input light having a plurality of spectral bands, the apparatus comprising:
3 an optical train that intercepts the input light and provides optical paths for
4 routing the spectral bands;
5 first and second photodetectors;
6 a plurality of dynamically configurable routing elements corresponding to the
7 plurality of spectral bands, each routing element having first and second states, said first state
8 causing that routing element to direct its respective spectral band to said first photodetector, said
9 second state causing that routing element to direct its respective spectral band to said second
10 photodetector;
11 a first electrical circuit coupled to said first photodetector to provide a signal
12 representing a quality characteristic of a modulated or unmodulated pattern of light impinging on
13 said first photodetector;
14 a second electrical circuit coupled to said second photodetector to provide a signal
15 representing optical power of light impinging on said second photodetector; and
16 a control circuit coupled to said routing elements operating

17 (a) to cause, during a first time interval, a first selected one of said routing
18 elements corresponding to a first selected spectral band to assume said first state while
19 causing the routing elements other than said first routing element to assume said second
20 state; and

21 (b) to cause, during a second time interval, a second selected one of said
22 routing elements corresponding to a second selected spectral band to assume said first
23 state while causing the routing elements other than said second routing element to assume
24 said second state;

25 whereby

26 said first electrical circuit provides, during said first and second intervals,
27 respective first and second quality characteristic signals representing the quality
28 characteristic for said first and second selected spectral bands, and

29 said second electrical circuit provides, during said first interval, a first optical
30 power signal representing the optical power of the spectral bands other than said first selected
31 spectral band, and during the second interval, a second optical power signal representing the
32 optical power for the spectral bands other than said second selected spectral bands.

1 19. (Allowed) The apparatus of claim 18, wherein said first electrical circuit
2 provides a signal representing, for each selected spectral band, one or more of signal-to-noise
3 ratio, bit error rate, optical power level, and optical wavelength center frequency.

1 20. (Allowed) The apparatus of claim 18, wherein said control circuit
2 sequentially selects each routing element in the plurality of routing elements so that the plurality
3 of spectral bands are sequentially communicated to said first photodetector in a round-robin
4 fashion.

1 21. (Allowed) The apparatus of claim 18, wherein said control circuit
2 sequentially selects each routing element in a desired subset of the plurality of routing elements
3 so that the corresponding subset of spectral bands are sequentially communicated to said first
4 photodetector in a round-robin fashion, whereupon said subset of spectral bands are monitored
5 for quality by said first electrical circuit and spectral bands not in said subset are not monitored
6 for quality by said first electrical circuit.

1 22. (Allowed) The apparatus of claim 18, wherein said first photodetector is a
2 PIN photodiode or an avalanche photodiode.

1 23. (Allowed) The apparatus of claim 18, wherein said optical train includes a
2 dispersive element.

1 24. (Allowed) The apparatus of claim 18, wherein at least one of said
2 dynamically configurable elements is a rooftop prism whose position can be changed to define
3 said first and second states.

1 25. (Allowed) The apparatus of claim 18, wherein each of said dynamically
2 configurable elements includes a mirror whose orientation can be changed to define said first and
3 second states.

1 26. (Allowed) The apparatus of claim 18, wherein said second electrical circuit
2 connected to said second photodetector computes the total optical power incident on said
3 photodetector and sets a threshold for triggering a fault condition if said optical power falls
4 below said threshold.

1 27. (Allowed) The apparatus of claim 20, in a system that further includes:
2 a coupler that directs a fraction of light traveling on a fiber to be monitored to said
3 optical train; and

4 a management processor that receives information based on said signal
5 representing a quality characteristic.

1 28. (New) A method of monitoring light having a plurality of spectral bands and
2 traveling along an optical fiber, the method comprising:

3 using a coupler to direct a fraction of light traveling along the fiber away from the
4 fiber, and, with respect to the light directed away from the fiber:

5 during a first time interval,

6 separating a first spectral band of the plurality of spectral bands from the
7 plurality of spectral bands,

8 directing the first spectral band to a photodetector while preventing the
9 spectral bands in the plurality of spectral bands other than the first spectral band from
10 reaching the photodetector, and

11 generating, with a wavelength-monitoring circuit that is coupled to the
12 photodetector, a first signal representing a quality characteristic of a modulated or
13 unmodulated pattern of light in the first spectral band; and

14 thereafter, during a second time interval,

15 separating a second spectral band of the plurality of spectral bands from
16 the plurality of spectral bands,

17 directing the second spectral band to the photodetector while preventing
18 spectral bands in the plurality of spectral bands other than the second spectral band from
19 reaching the photodetector, and

20 generating, with the wavelength-monitoring circuit, a second signal
21 representing a quality characteristic of a modulated or unmodulated pattern of light in the
22 second spectral band; and

23 providing the information based on the first and second signals representing a
24 quality characteristic to a management processor.

1 29. (New) The method of claim 28, and further comprising, during the first time
2 interval, generating a first power signal representing combined optical power of the spectral
3 bands other than the first spectral band.

1 30. (New) A method of monitoring input light having a plurality of spectral
2 bands, the method comprising:

3 during a first time interval,

4 separating a first spectral band of the plurality of spectral bands from the
5 plurality of spectral bands,

6 directing the first spectral band to a photodetector while preventing the
7 spectral bands in the plurality of spectral bands other than the first spectral band from
8 reaching the photodetector, and

9 generating, with a wavelength-monitoring circuit that is coupled to the
10 photodetector, a first signal representing a quality characteristic of a modulated or
11 unmodulated pattern of light in the first spectral band, the quality characteristic being one
12 or more of signal-to-noise ratio, bit error rate, and optical wavelength center frequency;
13 and

14 thereafter, during a second time interval,

15 separating a second spectral band of the plurality of spectral bands from
16 the plurality of spectral bands,

17 directing the second spectral band to the photodetector while preventing
18 spectral bands in the plurality of spectral bands other than the second spectral band from
19 reaching the photodetector, and

20 generating, with the wavelength-monitoring circuit, a second signal representing
21 the quality characteristic of the modulated or unmodulated pattern of light in the second spectral
22 band.

1 31. (New) The method of claim 30, and further comprising, during the first time
2 interval, generating a first power signal representing combined optical power of the spectral
3 bands other than the first spectral band.